



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,133	03/19/2004	David Pullen	1875.4110001/RS/KPP	6383
26111 7590 08/08/2007 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER PHUNG, LUAT	
			ART UNIT 2609	PAPER NUMBER
			MAIL DATE 08/08/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/804,133

**Applicant(s)**

PULLEN ET AL.

**Examiner**

Luat Phung

**Art Unit**

2609

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The pending claims 1-19 are presented for examination.

Claims 1-19 are rejected.

#### ***Specification***

1. The disclosure is objected to because of the following informalities: page 5, para. 24, "MAP" is mentioned for the first time. Is it an acronym or abbreviation for "bandwidth allocation map" of the DOCSIS standard specification?

Appropriate correction is required.

#### ***Claim Objections***

2. Claims 1-10 are objected to because of the following informalities.

Regarding claim 1, lines 6-8 mention "a number field" in the Ack packet in two places; which number in the TCP ACK message does this field refer to—Sequence number, Acknowledgement number or something else?

Claims 2-10 are objected to as being dependent upon an objected base claim, namely claim 1.

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 13-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 13, the limitation "a computer useable medium" recited in lines 1-2 is not a process, machine, manufacturer, or composition of matter, or any new and useful improvement thereof because there is no physical structure/connection of computer software recited in the claim.

Claims 14-19 are rejected as being dependent upon a rejected base claim, namely claim 13.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2609

6. Claims 1-2, 5-7, 10 and 13-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Bellaton, et al (US 6,473,425).

Regarding claims 1-2, 5-7 and 10, Bellaton discloses a method for in-place, lightweight Ack packet promotion, comprising:

receiving a new Ack packet; (Fig. 11, element 130; col. 8, line 45)

searching through a transmit queue for an old Ack packet that corresponds to the new Ack packet; (col. 8, lines 46-48; col. 9, lines 26-29) and

replacing the data in a number field, a checksum field, a window size field, and/or a timestamp options field of the old Ack packet with data in a number field, a checksum field, a window size field, and/or a timestamp options field of the new Ack packet, as recited in claim 1; (setting the pointers of the packet entry in the queue replaces the old packet with the new packet, in effect copying a number field, a checksum field, a window size field, a timestamp options field, inter alia, from the new packet to the old, per col. 9, line 63 to col. 10, line 1)

discarding the new Ack packet, as recited in claim 2; (col. 10, lines 4-6)

determining whether a Transmission Control Protocol (TCP) stream associated with the old Ack packet and a TCP stream associated with the new Ack packet are from the same stream (col. 6, lines 16-19), as recited in claim 5;

wherein the determining step comprises identifying the old Ack packet TCP stream and the new Ack packet TCP stream from a tuple (col. 8, lines 53-61), as recited in claim 6;

Art Unit: 2609

wherein the tuple includes a source IP address, a destination IP address, a source port number, and a destination port number (col. 8, line 63 to col. 9, line 7), as recited in claim 7;

queuing the new Ack packet for transmission if a corresponding old Ack packet is not found (Fig. 11, element 134, line NO to element with text "QUEUE NEW PACKET"), as recited in claim 10.

Claims 13-14 and 15-17 are apparatus claims corresponding to method claims 1-2 and 5-7, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1-2 and 5-7, respectively.

### ***Inventorship***

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 11 and 19 are rejected under U.S.C. 103(a) as being unpatentable over Bellaton, et al (US 6,473,425) in view of Akgun, et al (US 7,145,887).

Regarding claims 3 and 19, Bellaton discloses all of the subject matter as recited in paragraph 6 of this office action except queuing the new Ack packet for a piggyback request, as recited in claim 3, and wherein the first computer readable program code means, the second computer readable program code means, and the third computer readable program code means operate within a cable modem, as recited in claim 19.

Akgun from the same or similar fields of endeavor discloses a cable network comprising a cable modem (col. 8, lines 22-25), which sends the ACK using the ACK piggybacking method (col. 17, 23-25).

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention to combine the ACK filtering method of Bellaton with the ACK piggybacking method in a cable modem of Akgun by implementing the ACK filtering

Art Unit: 2609

method in a cable modem. The motivation for such a combination would have been to eliminate duplicate messages thus increase system throughput.

Regarding claim 11, Bellaton discloses a transmit queue (Fig. 9, element 116), which is searchable (col. 5, lines 60-65) to perform the methods as recited in paragraph 6 of this office action. Bellaton discloses all of the subject matter except a system for in-place Ack packet promotion, comprising:

a cable modem in communications with a cable network and configured to receive one or more Ack packets for delivery over the cable network; and  
a transmit queue coupled to the cable modem.

Akgun from the same or similar fields of endeavor discloses a cable modem which is part of a cable network (col. 8, lines 22-25) and is configured to processing arriving TCP packets for transmitting to the cable modem termination system (col. 9, lines 22-26).

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention to combine transmit queue and the ACK filtering method of Bellaton with the cable modem of Akgun by implementing the transmit queue and the ACK filtering method in a cable modem. The motivation for such a combination would have been to improve system performance in a cable system.

10. Claims 8 and 9 are rejected under U.S.C. 103(a) as being unpatentable over Bellaton, et al (US 6,473,425) in view of Boucher, et al (US 6,434,620).



Regarding claims 8 and 9, Bellaton discloses all of the subject matter as disclosed in paragraph 6 of this office action. Bellaton does not disclose utilizing a hash algorithm to execute the determining step, wherein the hash algorithm includes the checksum fields of the old Ack packet and the new Ack packet, as recited in claim 8; and utilizing a source port number in the hash algorithm to execute the determining step, wherein the source port number identifies a source of a corresponding TCP stream. Boucher from the same or similar fields of endeavor discloses a hash key generated from the IP and TCP headers, specifically IP addresses and TCP ports, (col. 7, lines 62-63) of an incoming frame to compare with those in the communication control block (CCB) to determine if the frame is associated with one of the CCBs.

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention to combine transmit queue and the ACK filtering method of Bellaton with the hash method of Boucher by executing the hash algorithm with the checksum and source port fields of the old and new Ack packets to determine if their corresponding TCP streams are associated with each other. Although Boucher does not disclose using the checksum field to generate the hash key, examiner takes official notice that it is well known in the art that various fields in the header can be used as input to a hash algorithm. The motivation for such a combination would have been to quickly and reliably search the queue for a corresponding old Ack packet.

Art Unit: 2609

11. Claim 12 is rejected under U.S.C. 103(a) as being unpatentable over Bellaton, et al (US 6,473,425) and Akgun, et al (US 7,145,887) in view of Boucher, et al (US 6,434,620).

Regarding claim 12, Bellaton and Akgun disclose all of the subject matter as disclosed in paragraph 9 of this office action. Bellaton and Akgun do not disclose wherein a hash algorithm, when executed, determines whether a Transmission Control Protocol (TCP) stream associated with the older Ack packet and a TCP stream associated with the new Ack packet are from the same stream. Boucher from the same or similar fields of endeavor discloses using a hash key to determine if an incoming frame is associated with one of the communication control blocks (col. 7, lines 63-64 and 55-57).

Thus it would have been obvious to the person of ordinary skill in the art at the time of the invention to combine transmit queue and the ACK filtering method in a cable modem of Bellaton and Akgun with the hash method of Boucher by executing the hash algorithm to determine if the corresponding TCP stream associated with old Ack is associated with that associated with the new Ack. The motivation for such a combination would have been to quickly and reliably search the queue for a corresponding old Ack packet.

***Allowable Subject Matter***

12. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following documents are cited to show system pertinent to applicant's invention.

Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name
US-2003/0223422 A1	12-2003	Igarashi et al.
US-6,687,227 B1	02-2004	Li et al.
US-2004/0085915 A1	05-2004	Gronau et al.
US-2004/0205770 A1	10-2004	Zhang et al.
US-2004/0202166 A1	10-2004	Dillon, Douglas M.
US-2004/0213278 A1	10-2004	Pullen et al.
US-6,894,974 B1	05-2005	Aweva et al.
US-6,928,052 B2	08-2005	Packer, Robert L.

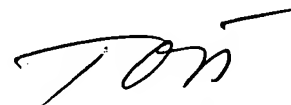
Art Unit: 2609

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luat Phung whose telephone number is 571-270-3126. The examiner can normally be reached on Monday to Friday, 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dang Ton can be reached on 571-272-3171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LP

A handwritten signature in black ink, appearing to read 'D. Ton' with a stylized flourish at the end.

DANG T. TON  
SUPERVISORY PATENT EXAMINER